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Laser Technology for the Deployment of Sodium-Layer Guide Stars

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Presented to the

Abstract

Sodium-layer guide stars are used as artificial beacons in adaptive optic schemes to correct for the blurring effects of atmospheric turbulence on ground based astronomical images. The requirements on these lasers in terms of average power, temporal and spectral format and beam quality are dictated by factors such as the observation wavelength, atmospheric conditions and details of the adaptive optics system. These requirements are relatively straightforward and are discussed in the presentation. There are other requirements on the laser technology having to do with pointing accuracy and stability, operational control systems, thermal loads in the dome, safety and aircraft detection methods which are not as straightforward. These requirements are discussed in the context of the laser system already deployed at the Lick Observatory and that designed for the Keck Observatory.

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